

Review 4.6-4.8

Key

Name _____ Date _____ Period _____

1. Describe all of the transformations used on the basic function $f(x) = \sqrt[3]{x}$, to obtain the graph of $g(x) = 2\sqrt[3]{-x+5} - 1$ and sketch the graph.

$f(x) = \sqrt[3]{x}$

x	y
-8	-2
-1	-1
0	0
1	1
8	2

left 5

x	y
-13	-2
-6	-1
-5	0
-4	1
3	2

Reflect across y-axis

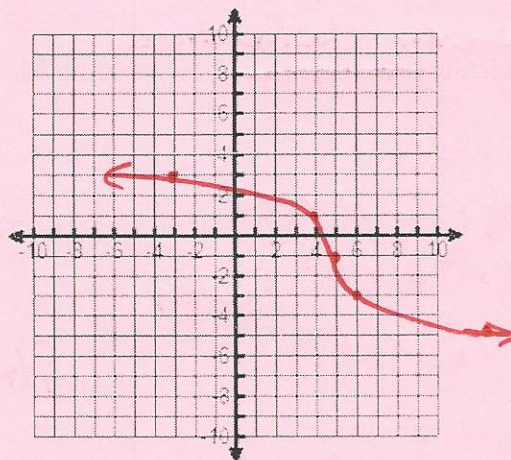
x	y
13	-2
6	-1
5	0
4	1
-3	2

vert. stretch by 2

x	y
13	-4
6	-2
5	0
4	2
-3	4

down 1

x	y
13	-5
6	-3
5	-1
4	1
-3	3



2. Describe all of the transformations used on the basic function $f(x) = 3^x$, to obtain the graph of $g(x) = -3^{x-1} + 2$ and sketch the graph.

$f(x) = 3^x$

x	y
-2	1/9
-1	1/3
0	1
1	3
2	9

Right 1

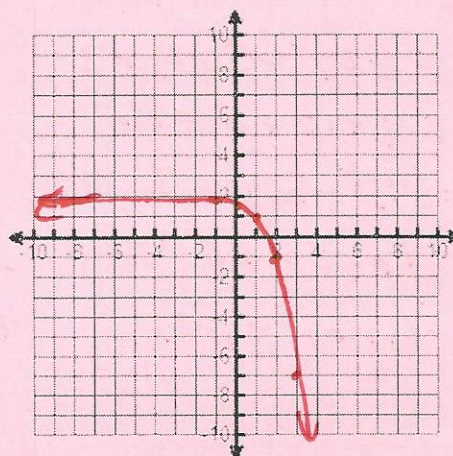
x	y
-1	1/9
0	1/3
1	1
2	3
3	9

Reflect across x-axis

x	y
-1	-1/9
0	-1/3
1	-1
2	-3
3	-9

up 2

x	y
-1	-17/9
0	-5/3
1	1
2	-1
3	-7



Describe the basic parent graph and a sequence of transformations that can be used to produce a graph of the given function.

3. $f(x) = -\sin(x) - 5$

Parent graph $f(x) = \sin x$
Reflection across x-axis
vert. shift down 5

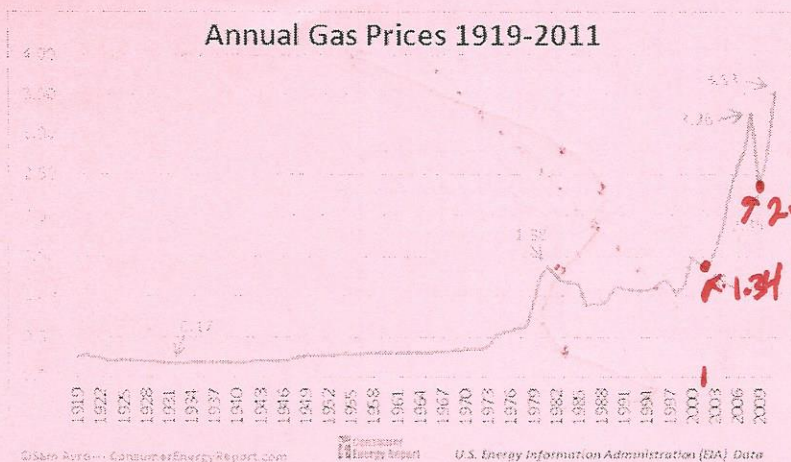
4. $f(x) = \frac{1}{2}\sqrt{x-4} + 8$

Parent graph $f(x) = \sqrt{x}$
Right 4
vert. shrink by factor of 1/2
vert. shift up 8

5. $f(x) = (-x-3) + 7$

Parent graph $f(x) = x$
horiz. shift right 3
Reflect across y-axis
vert. shift up 7

15. The graph below shows the annual gas prices from 1919-2011. Find the average rate of change from 2002 to 2009?



$$(2002, 1.34) (2009, 2.35)$$

$$\frac{2.35 - 1.34}{2009 - 2002} = \frac{1.01}{7}$$

$$\approx .144$$

$$.144 \text{ \$/year}$$

Find the inverse of each function and state the domain of each. Show all work!

16. $f(x) = \sqrt{x-7} + 5$

Domain: $[7, \infty)$

Range: $[5, \infty)$

$f^{-1}(x) = (x-5)^2 + 7$ Domain: $[5, \infty)$

$$x = \sqrt{y-7} + 5$$

$$(x-5)^2 = (\sqrt{y-7})^2$$

$$(x-5)^2 + 7 = f^{-1}(x)$$

17. $f(x) = \frac{2x-1}{x+3}$

Domain: $(-\infty, -3) \cup (-3, \infty)$

Range: $(-\infty, 2) \cup (2, \infty)$

$f^{-1}(x) = \frac{-3x-1}{x-2}$

Domain: $(-\infty, 2) \cup (2, \infty)$

$$(y+3)x = \frac{2y-1}{y+3}(y+3)$$

$$xy + 3x = 2y - 1$$

$$xy - 2y = -3x - 1$$

$$\frac{y(x-2)}{x-2} = \frac{-3x-1}{x-2}$$

18. $f(x) = \frac{3x-16}{11}$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

$f^{-1}(x) = \frac{11x+16}{3}$

$$11 \cdot x = \frac{3x-16}{11} \cdot 11$$

$$11x = 3x - 16$$

$$\frac{11x+16}{3} = \frac{3x}{3}$$

19. $f(x) = -2(x-4)^3 - 9$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

$f^{-1}(x) = \sqrt[3]{\frac{x+9}{-2}} + 4$

Domain: $(-\infty, \infty)$

$$x = -2(y-4)^3 - 9$$

$$\frac{x+9}{-2} = \frac{-2(y-4)^3}{-2}$$

$$\sqrt[3]{\frac{x+9}{-2}} = (y-4)$$

$$\sqrt[3]{\frac{x+9}{-2}} + 4 = y$$